REMARKS

Reconsideration and allowance of this Application are respectfully requested. Upon entry of the foregoing amendment, claims 1 and 4-7 are pending in the application. Claim 7 has been added to clarify the subject matter of the present invention. Support for claim 7 is found, for example, on page 7, lines 1 and 5 of the specification. Claim 7 introduces no new matter, and entry of claim 7 is respectfully requested.

The Office Action rejected claims 1 and 4-6 under 35 U.S.C. § 102(e) over U.S. Patent No. 5,959,307, issued to Nakamura et al. ("Nakamura"). Applicants traverse the rejection because Nakamura fails to disclose each element of the claimed invention. In particular, Nakamura fails to teach or suggest a group III nitride semiconductor light-emitting device including barrier layers and an n-type clad layer wherein the n-type clad layer is formed of a material substantially the same as the barrier layers, as recited in claim 1.

Furthermore, Applicants respectfully submit that Nakamura fails to teach or suggest a group III nitride semiconductor light-emitting device including barrier layers and an n-type clad layer wherein the n-type clad layer and the barrier layers are formed of GaN, as recited in newly presented claim 7.

As indicated by the Examiner in the July 17, 2002 interview, Nakamura discloses that two first layers, provided to sandwich an active layer, have a band gap energy which is larger than that of the active layer by 0.01-4.05 eV (col. 4, lines 15-21). The Examiner further provided an exemplary MQW active layer consisting of alternating well layers and barrier layers. It is the Applicants' representatives' understanding that the exemplary well layers provided by the Examiner are $In_{0.2}Ga_{0.8}N$ with a band gap energy of ~3eV and the exemplary barrier layers are $In_{0.01}Ga_{0.99}N$ with a band gap energy of ~3.4eV. The Examiner indicated that the "effective" band-gap energy of such an exemplary active layer would be ~3.2eV.

Nakamura discloses two first layers, provided to sandwich the active layer, having a band gap energy which is larger than that of the active layer by 0.01-4.05 eV. The Examiner concluded that a first layer in Nakamura could exceed the "effective" band gap energy ~3.2 eV of the exemplary active layer by 0.2 eV, resulting in a first layer with a band gap energy of ~3.4eV. Accordingly, because the band gap energy of the first layer and the exemplary barrier layer would be equal, the Examiner concluded that the first layer in Nakamura could be made of material substantially the same as the exemplary barrier layer.

However, Applicants respectfully submit that the effective band gap energy of the active layer is not rendered by the simple arithmetic average of the band gap of the barrier layers and the well layers, as presented by the Examiner during the interview. In particular, Applicants submit that the total band gap energy varies depending on the type of MQW structure.

The Office Action alleges that "[Nakamura] includes clad band gaps which are greater than the active layer's effective band-gap... but at the very least would include band gaps which are the same as the barrier layer (for the situation where the barriers and tunneling/clad are of the same material)." However, Applicants respectfully submit that Nakamura discloses in col. 4, lines 46-52 that, due to a tunneling effect, carriers will be effectively injected into the active layer "and will not overflow the active layer because they are blocked by the first layers." This disclosure is further reinforced by Fig. 5 in Nakamura, which illustrates how layers 101 and 201 function as clad layers to block the carriers from overflowing. If, as the Examiner alleges, layers 101 and 201 in Nakamura included band gaps which are the same as the barrier layer, Applicants submit that it would be detrimental to the effect of blocking carrier overflow by layers 101 and 201. Accordingly, Applicants submit that layers 101 and 201 are not formed of a material substantially the same as the barrier layers, as recited in claim 1.

As such, Nakamura fails to anticipate claim 1. Claims 4-6 depend from claim 1. Applicants have discussed above how independent claim 1 is distinguished and allowable over Nakamura. By virtue of their dependence from claim 1, rejected claims 4-6 also include this subject matter. As such, dependent claims 4-6 are allowable for at least the same reasons as independent claim 1. Reconsideration and withdrawal of the rejection of claims 1 and 4-6 are respectfully requested.

Furthermore, Nakamura does not disclose that the first layers and the barrier layers are formed of GaN, as recited in newly presented dependent claim 7. To the contrary, Nakamura discloses that the two first layers comprise an indium-containing nitride semiconductor (col. 4, lines 15-18). Nakamura discloses that "the n-type light-guiding layer 15 [in the embodiment of FIG. 2] is preferably formed of an indium-containing n-type nitride semiconductor or an n-type GaN [containing indium]," (col. 5, lines 61-63). Nakamura discloses that "the first n-side nitride semiconductor layer 201 is formed of an aluminum-containing nitride semiconductor layer," (col. 10, lines 14-16). Accordingly, Nakamura fails to disclose an n-type layer and barrier layers formed of GaN, as recited in claim 7.

All of the stated grounds of rejection have been properly traversed. In view of the foregoing, the claims and specification are in form for allowance, and such action is hereby solicited. If the Examiner believes, for any reason, that personal communication will

expedite prosecution of this application, the Examiner is requested to call the undersigned at the number provided.

Respectfully submitted,

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